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further response to that particular strength of stimulus is possible. This individual attunement may persist, and may be inherited and thus initiate a racial attunement.

The author does not claim that this is a complete explanation of the facts. It is merely a tentative hypothesis. But it is almost too soon to attempt even an hypothesis, for if we try to compare the critical points of the various kinds of stimuli in their effects upon the rate and the direction of growth, in order to see what relation exists between them and how they are related to adaptive responses of the organism, we find the data often contradictory and always inadequate. For example, if we compare the tables given on page 439, we find that of the seven species mentioned in Table 45, only four are to be found in Table 46. Moreover, the first mentions the organs affected, while the second leaves us in doubt as to whether we are dealing with root or stem. Similar difficulties arise in an attempt to compare the table on page 454 with those on pages 464 and 465. All this goes to show that, in spite of all that has been done, more work is needed, and the author's hypothesis will be of value if it serves no other purpose than to stimulate research from a broad point of view.

We notice few errors and omissions. On page 411, line 4, for *plant* read cylinder. The important work of Martin and Friedenwald[1] on the effect of light upon metabolism in animals has been overlooked. On page 440 a diagram of the spectrum is given, showing an interesting coincidence between the point of maximum retardation of growth and that of no phototropic effect. But this coincidence is not mentioned in the text.

R. P. B.

Variation Statistics.[2] — In this work Duncker provides naturalists with the new tool which the English anthropologists, zoölogists, and mathematicians have developed. Many of the works of the mathematicians, especially the invaluable treatises of Pearson, have been beyond the mathematical training of most biologists. In this paper the results of these treatises are given in a comparatively simple fashion. Great stress — relatively too much in the reviewer's opinion — is laid on the methods of constructing the various types of curves agreeing with any observed distribution of varying individuals. To solve some of the equations, logarithms, trigonometric functions and gamma functions have to be employed, and it is too much to hope that a large proportion of naturalists can use even these simple methods. Yet naturalists who desire to reach best results from their data must get out their algebras, trigonometries, and logarithmic tables, and brush up on these subjects. Formulas are used very freely, which is no doubt an offense to some. It should be remembered, however, that a formula is only an abbreviated statement of operations, and very useful to any one who knows how the operations indicated are performed. The author gives the various indices of variability. He objects to the use of the coefficient of variability (obtained by dividing the index of variability by the mean) and maintains that the view that we expect high indices of variability where the mean is high is untenable. As evidence for this conclusion he points to the fact that in the four numerical examples given in his paper the index of variability is inversely proportional to the mean. This is, however, absolutely no evidence against the value of the coefficient of variation, since, doubtless, the large characteristic which has a small index of variability is, in comparison with the small character having a large index, relatively even less variable than a comparison of the mere indices would indicate.

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[1] Martin, H. N., and Friedenwald, J. Some Observations on the Effect of Light on the Production of Carbondioxide Gas by Frogs, *J. H. U. Studies*, iv, 5, p. 221, 1889.

[2] Duncker, G. Die Methode der Variations-Statistik, *Ant. für Entwickelungs-mechanik der Organismen*, Bd. viii, pp. 112–183. Feb. 21, 1899.

Correlation is treated of briefly, and an excellent short method of calculating the coefficient of correlation is given. The calculation of spurious correlation of indices is not given — an important omission ; and little is said about multimodal curves, which are frequent in biological statistics.

A bibliography of 111 titles is given (from which Fechner's 1897 work is omitted), and tables of formulas add greatly to the usefulness of the paper.

Altogether the paper is one which every student of statistical biology — *and this ought to include every systematic worker in zoölogy and botany* — should have.

Inheritance of Acquired Qualities.[1] — Conidia of *Aspergillus niger* of common origin are reared (*A*) in Raulin solution; (*B*) in Raulin solution + 6 per cent NaCl for *one* generation ; and (*C*) in Raulin solution + 6 per cent NaCl for *two* generations. Then :

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[1] Errera, L. Hérédité d'un caractère acquis chez un champignon pluricellulaire, *Bull. Acad. Roy. de Belg.*, 1899, pp. 81–102.